starting-point for an investigation of Barrow's book—at least before the present translation appeared—is A. E. Shapiro's edition (1984) of the *Optical Lectures, 1670—72* of Newton, which themselves languished in MS. until after Newton's death. Newton's lectures owed much to Barrow's, which they followed; on certain points Newton was content to let Barrow say the last word.

Building on the foundations of Kepler, Descartes and Huygens, Barrow's object was to determine the paths of light through lens, and so the formation and position of images. The technical problems he has to solve in his treatment are neither experimental nor physiological but purely geometrical, and though his technique was soon to be superseded Barrow showed great skill in his solutions. As is well known Barrow's statements about the physics of light were unadventurous: he knew no way of deciding whether light is a corpuscular stream or an action diffused through transparent media. His guesses about the qualitative differences between light of various colours are barely intelligible (end of Lecture XII). Though Barrow's English sermons have been admired, he is not (to my mind) easy to read in Latin, as in the following (randomly noted) sentence, where the thought is easy enough: 'Images, however, are clearly nothing but light, so reflected or refracted from objects that it is again gathered together in one place, and in such a position as it had when it issued from the original object.' I prefer my literal rendering to that printed here ('. . . collected again in one place and in a disition such as it held when it flowed . . .'), because the word *disposition* does not carry the sense of *spatial order* which is clearly intended (W. Whewell (ed.) *Mathematical Works of Isaac Barrow* (1860), II, 14; this translation, p. 13).

The difficult task of rendering Barrow into English was undertaken and printed by the Worshipful Company of Spectacle Makers as a pious tribute to a great early English exponent of lens-theory, and is less directed to professional historians than to professional opticians. The historical notes are brief but adequate, the general layout helpful especially as regards modernization and interpretation. I found the English on the stiff side, but a comprehensible version of a book that has been far more often mentioned than read must be warmly welcomed.

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GRAHAM REES assisted by CHRISTOPHER UPTON. **Francis Bacon's Natural Philosophy: A New Source.** A transcription of manuscript Hardwick 72A with translation and commentary. Chalfont St Giles, Bucks.: British Society for the History of Science, 1984. £7.90.

Among the many documents unearthed by Peter Beal in preparing his epoch-making *Index of Literary Manuscripts Vol.1: 1450–1625* (London: Mansell, 1980) were two manuscripts by Francis Bacon in the library of Chatsworth House. Bacon's literary activities were, of course, intensive and variegated, employing at times several amanuenses to produce fair draughts of his work, which would then become the basis for further elaboration. His literary *Nachlass* must have been considerable, although little has surfaced. In a letter to Robert Boyle on 9 November 1663 (not known to Bacon scholars, it would seem) Dr John Beale recorded how, when Boyle first met him at Eton, in the time of Sir Henry Wotton

> I was reputed a schoolman (though I had then read thoroughly much more of lord *Bacon* than is yet printed, having seen in manuscript all his embryos, his *gradus rerum & gradus verborum*; and the prefaces, and joints, and ancephalæosis to all his judgments as lord chancellor; which raised me a little above a mere schoolman . . . (Robert Boyel, *Works* ed. T. Birch, 6 vols, ²1772; VI, 355).

One would give a great deal to see those manuscripts, or to know what has become of them.

The 'embryo' here reproduced is a draught of a treatise called *De viis mortis, et de senectute retardanda, atque instaurandis viribus* ('An inquiry concerning the ways of death, the

postponing of old age, and restoration of the vital powers'). Graham Rees, the editor, acknowledges the assistance of Christopher Upton in translating the piece; he has himself provided a meticulous transcription and a full introduction (78 pages) describing the work and setting it both in its general context in Renaissance natural philosophy and in Bacon's intellectual development. He argues convincingly that the two treatises designated by Peter Beal in fact belong together, a characteristic Baconian mingling of aphorisms with more continuous prose sections, and dates it to about 1611, with later revisions, Bacon abandoning it 'unfinished at some time before 1620'. Rees reconstructs in fascinating detail Bacon's habits of composition and revision, and places it in what he has called 'Bacon's speculative philosophy', the 'alternative' strand of thought that he has defined running in parallel with Bacon's better-known work on induction and scientific method. While in fact Bacon's programme for a comprehensive 'Natural History', embracing all aspects of nature and life, was much more influential in the seventeenth century than his cumbersome logic, I feel that Rees overvalues the 'speculative philosophy'. His expositions, in articles in *Ambix* and elsewhere, of what he calls Bacon's 'semi-Paracelsian cosmology' (which half of Paracelusus? one wants to ask), seems to be doubtful on several heads, and here he overstates both the amount of this vein of thinking in Bacon ('the huge volume of speculative materials') and its importance ('unique . . . important . . . seminal . . . absolutely crucial . . . crucial synaptic event'). The embarrassing fact that proponents of this thesis must account for is why Bacon, if he thought that this constituted a 'worthwhile body of substantive natural philosophy', should have not published it, and aborted the embryos.

But apart from these doubts about the overall value of this fragmentary treatise, the introduction offers a useful account of the Renaissance doctrine of spirits, and various competing theories on the prolongation of life. The translation is serviceable, the textual and critical notes very helpful. All in all, the standards of accuracy and dedication to the text augur well—'I heard a bird so sing'—for the welcome project of a new edition of Bacon's complete works, over which Dr Rees is to preside.

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THOMAS SÖDERQVIST. **The Ecologists, from Merry Naturalists to Saviours of the Nation: A sociologically informed narrative survey of the ecologization of Sweden 1895–1975.** Stockholm: Almqvist and Wiksell, 1986. Pp. vii+330. ISBN 91-22-00827-6. No price given.

This book ought to be very welcome. Ecology in other countries, especially those of Northern and Eastern Europe, has always been somewhat inaccessible to British readers—even practising ecologists. This is not only due to a barrier of language, important though that has been. There is also the difficulty that the technical content of ecology in those countries has traditionally been somewhat distinct from the Anglo-American variety. Indeed, as Frank Egler pointed out some time ago and as Söderqvist vividly re-exemplifies, the term 'ecology' itself means something different to European and American vegetation scientists. So one of the principal questions a British reviewer must ask is—how far Söderqvist has succeeded in making the history of Swedish ecology accessible and intelligible to an English-speaking audience?

Regarded from this perspective, the book has two major limitations. One is that Söderqvist assumes rather more background knowledge of the Swedish academic system than the average British reader, if this reviewer is at all representative, may reasonably be expected to possess. The other is that he has deliberately and self-consciously set out to tell the story of ecology in one country, with very little international contextualization. Thus, it is very difficult to compare events in Söderqvist's Sweden with the development of, for example, British ecology. The effects of